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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/767,875	01/29/2004	Young-Jun Kim	51813/P8-49	4124
23363 7590 03/01/2010 CHRISTIE, PARKER & HALE, LLP PO BOX 7068 PASADENA, CA 91109-7068				
EXAMINER				
WALKER, KEITH D				
ART UNIT		PAPER NUMBER		
1795				
MAIL DATE		DELIVERY MODE		
03/01/2010		PAPER		

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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte* YOUNG-JUN KIM and JAE-HOU NAH

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Appeal 2009-004565  
Application 10/767,875  
Technology Center 1700

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Decided: February 26, 2010

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Before EDWARD C. KIMLIN, ADRIENE LEPIANE HANLON, and  
PETER F. KRATZ, *Administrative Patent Judges*.

KRATZ, *Administrative Patent Judge*.

DECISION ON APPEAL

This is a decision on an appeal under 35 U.S.C. § 134 from the Examiner's final rejection of claims 10 and 12. We have jurisdiction pursuant to 35 U.S.C. § 6.

Appellants' claimed invention is directed to a rechargeable lithium battery including a negative electrode. Also, a negative electrode for a rechargeable lithium battery is claimed. All of the appealed claims require that the negative electrode consists essentially of a carbonaceous negative active material and an aqueous binder consisting essentially of a butadiene-based rubber and a cellulose-based compound.

Claim 10 is illustrative and reproduced below:

10. A negative electrode for a rechargeable lithium battery, the negative electrode consisting essentially of a carbonaceous negative active material and an aqueous binder, the aqueous binder consisting essentially of a butadiene-based rubber and a cellulose-based compound, wherein during charging of the rechargeable lithium battery a total amount of gas is generated, the gas having a CO content of 30 volume % or less and a H<sub>2</sub> content of 0.2 volume % or less.

The Examiner relies on the following prior art reference<sup>1</sup> as evidence in rejecting the appealed claims:

Idota	5,618,640	Apr. 8, 1997
Takmi	5,753,387	May 19, 1998

Claims 10 and 12 stand rejected under 35 U.S.C. § 102(b) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over Idota.

On this record, we reverse the stated rejection(s).

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<sup>1</sup> The Examiner refers to a portion of the disclosures of Takami (U.S. Patent No. 5618640) and Hirato (JP Publication No. 2001-023630) (Ans. 7; see also Ans. 3). However, these references were not recited in the statement of the rejection (Ans. 3-4). Consequently, we do not consider these references as evidence of anticipation and/or obviousness that is before us. See *In re Hoch*, 428 F.2d 1341, 1342 n.3 (CCPA 1970).

### ISSUE/CONCLUSION

Has the Examiner established that Idota describes and/or would have rendered obvious to one of ordinary skill in the art, subject matter, as required by the appealed claims, including a negative electrode for a rechargeable lithium battery consisting essentially of a carbonaceous negative active material and an aqueous binder consisting essentially of butadiene-based rubber and a cellulose-based compound?

We answer no.

### PRINCIPLES OF LAW

“During examination, ‘claims . . . are to be given their broadest reasonable interpretation consistent with the specification, and . . . claim language should be read in light of the specification as it would be interpreted by one of ordinary skill in the art.’” *In re Am. Acad. of Sci. Tech Ctr*, 367 F.3d 1359, 1364 (Fed. Cir. 2004), quoting *In re Bond*, 910 F.2d 831, 833 (Fed. Cir. 1990). It is well settled that the term "consisting essentially of" limits the scope of a claim to the specified ingredients and those that do not materially affect the basic and novel characteristic(s) of a composition.

In order for the Examiner to establish a prima facie case of anticipation, each and every element of the claimed invention, arranged as required by the claim, must be found in a single prior art reference, either expressly or under the principles of inherency. *See generally, In re Schreiber*, 128 F.3d 1473, 1477 (Fed. Cir. 1997).

“[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness”. *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006), cited with approval in *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 417-18 (2007).

The Examiner bears the initial burden, on review of prior art or on any other ground, of presenting a prima facie case of non-patentability. *In re Oetiker*, 977 F.2d 1443, 1445 (Fed. Cir. 1992).

### FINDINGS OF FACT/ANALYSIS

The entirety of the Examiner’s statement of rejection in the Final Office action (FOA), as repeated in the Answer, is:

Claims 10 & 12 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over US Patent 5,618,640 (Idota).

Idota discloses a rechargeable lithium battery with a negative electrode consisting essentially of a carbonaceous material as the negative electrode active material and an aqueous binder mixture consisting essentially of carboxymethyl cellulose and styrene-butadiene rubber (1:15-35, 13:40-66, 20:24-27). A separator is used in the completed assembly of the battery (Fig. 2; 2:55-62). Since the battery is made in a similar manner with similar components as the claimed invention and the amount of gas generated is a property of the components of the battery, the amount of gas discharged by the battery of Idota is inherently the same as the claimed invention.  
FOA 3-4; Ans. 3-4.

At page 5 of the Answer, the Examiner states that “Idota teaches negative electrodes consisting essentially of carbonaceous material are well-known in the art (1:10-32).” In this regard, the Examiner relies on the cited portions of the Background of the Invention section of Idota for an alleged

description of the carbonaceous active material required for Appellants' negative electrode as set forth in claims 10 and 12. However, Idota does not describe any particular binder used with the carbonaceous material negative electrode referred to in the Background of the Invention section of Idota, much more a binder consisting essentially of a butadiene-based rubber and a cellulose-based compound as required by the appealed claims. Rather, Idota, in the Background of the Invention section thereof, discusses a problem with dendritically growing lithium associated with prior negative electrode materials including carbonaceous material of non-aqueous secondary batteries and Idota notes other problems associated with other known negative electrode materials (Idota, col. 1, l. 10 - col. 2, l. 23).

Apparently recognizing this lack of an explicit disclosure of Appellants' binder in conjunction with the negative electrode active carbonaceous materials alleged as described in the Background section of the invention of Idota, the Examiner turns to Idota's description of binders that can be used with Idota's negative electrode active material by referring to columns 13 and 14 of Idota and Example A-6 of Idota for an alleged teaching of well-known binders (Ans. 6).

In this regard and in the second citation to Idota supplied by the Examiner in the rejection statement (col. 13, ll. 40-66) and continuing over through column 14 thereof, Idota discloses materials including a conductor (such as one or more conductors from a non-exclusive list of conductors provided), a binder (such as one or more binders selected from a non-exclusive list furnished, which with appropriate selection may result in a binder comprising butadiene-based resins and a cellulose-based material), and a filler and other materials that can be used as part of the materials of the

negative electrode. It is important to note that these materials are in addition to Idota's negative electrode active material (one or more compounds of formula I to V, as discussed earlier in Idota).

Turning to the third (last) citation to Idota listed by the Examiner in the stated rejection (col. 20, ll. 24-27), Idota describes a negative electrode mixture of materials employed in forming the negative electrode of Example A-6. While the binder for Example A-6 is an aqueous dispersion of styrene-butadiene rubber and carboxymethylcellulose, Idota makes it clear that the active material in the negative electrode of this Example comprises 86 percent of SnO or SnO<sub>2</sub>.

Given the above, the Examiner's proposed combination of the carbonaceous negative electrode material described in the Background of the Invention of Idota with a particular binder selected from Example A-6 and the description of Idota's invention, whereat the binder is disclosed as being used with a negative electrode active material that is a compound material of Idota's Formula I-V, manifestly falls short of establishing an anticipatory disclosure by Idota. The Examiner has not reasonably established that Idota suggests such a combination to one of ordinary skill in the art under an obviousness standard; much less describe such a combination under the appropriate test for anticipation, as argued by Appellants (Ans. 6-7; App. Br. 4-7; Reply Br. 2).

Also, we observe that the Examiner does not appear to rely on Idota's Example A-6 as being anticipatory of Appellant's claimed subject matter, much less explain how the appealed claims could be read on this Example. Nor does the Examiner explain how this Example would have rendered the claimed subject matter obvious to one of ordinary skill in the art by itself or

in combination with the referred to disclosures at columns 13 and 14 of Idota.

In this latter regard and according to Appellants, the presence of the active material of Idota in the negative electrode of Appellants would have been expected to materially affect the basic and novel characteristics of the claimed negative electrode (App. Br. 4). Appellants have furnished an argument predicated on evidence explaining why the transitional “consisting essentially of” term used for introducing the claimed negative electrode material precludes the presence of negative electrode active material of Formulas I-V as taught by Idota, such as the amounts of SnO or SnO<sub>2</sub> of Example A-6 of Idota. *Id.* The Examiner does not lodge a persuasive alternative construction of this claim term or provide convincing reasoning explaining why Appellants’ argued construction of the “consisting essentially of” transition claim term should not be accepted as being reasonably accurate.

The Examiner presents an inherency theory asserting that Idota necessarily describes a battery with the functional gas generation property of a battery corresponding to that claimed. We do not address this further contention of the Examiner as the Examiner has not made out a prima facie case of anticipation or obviousness for the reasons already set out above. We note, however, that Appellants attribute this battery property not only to the battery of claim 12, but, also, to the *electrode* of claim 10.

As a final point, we note our agreement with Appellants’ reasoned position concerning the Examiner’s erroneous interpretation of the appealed claims as product-by-process claims.



**ORDER**

The Examiner's decision to reject claims 10 and 12 under 35 U.S.C. § 102(b) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over Idota is reversed.

**REVERSED**

PL Initial:  
sld

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